Physically Consistent Winds and Pressures

- Combine wind and pressure data to make better fields of both parameters

- Force physical consistency.

http://campus.fsu.edu/
bourassa@coaps.fsu.edu

Concept

- The UW planetary boundary-layer model does an excellent job in physically matching vector winds and pressures.
  - Jerome Patoux and Robert A. Brown (2002, *JAM*, **41**, 133-143)
  - It works in the tropics and outside the tropics.
  - Vector winds are pressures are physically consistent.
- We will modify our objective gridding code to utilize the UW model as a hard constraint.
  - That means the output is forced to be consistent with the model
  - This constraint will allow us to assimilate vector winds, pressures, and scalar wind speed in a physically consistent manner.
    - Reducing the number of soft constraints.
    - Greatly increasing the data density of observations that contribute to the solution.
- The UW group have shown that the approach works for determining surface pressure from scatterometer winds.

UW QSCAT Examples

Graphics acquired from http://pbl.atmos.washington.edu/~airsea/UWPBL40/